

16
RACCOON CREEK, N. J.

L E T T E R

FROM

THE SECRETARY OF WAR,

TRANSMITTING,

WITH A LETTER FROM THE CHIEF OF ENGINEERS, REPORTS ON
PRELIMINARY EXAMINATION AND SURVEY OF RACCOON CREEK,
N. J., INCLUDING THE CONSTRUCTION OF A DIKE OR JETTY AT
THE MOUTH IF NECESSARY.

FEBRUARY 27, 1914.—Referred to the Committee on Rivers and Harbors and ordered
to be printed, with illustrations.

WAR DEPARTMENT,
Washington, February 26, 1914.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

SIR: I have the honor to transmit herewith a letter from the
Acting Chief of Engineers, United States Army, dated 25th instant,
together with copies of reports from Maj. R. R. Raymond, Corps
of Engineers, dated May 14 and December 16, 1913, with maps, on
preliminary examination and survey, respectively, of Raccoon
Creek, N. J., made by him in compliance with the provisions of the
river and harbor act approved March 4, 1913.

Very respectfully,

LINDLEY M. GARRISON,
Secretary of War.

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, February 25, 1914.

From: The Chief of Engineers, United States Army.

To: The Secretary of War.

Subject: Preliminary examination and survey of Raccoon Creek, N. J.

1. There are submitted herewith, for transmission to Congress,
reports dated May 14 and December 16, 1913, with maps, by Maj.

R. R. Raymond, Corps of Engineers, on preliminary examination and survey, respectively, of Raccoon Creek, N. J., including the construction of a dike or jetty at the mouth if necessary, authorized by the river and harbor act approved March 4, 1913.

2. Raccoon Creek is a crooked tidal stream emptying into the Delaware River about 18 miles below Philadelphia. The existing project for its improvement contemplates the formation of a dredged channel 7 feet deep and 75 feet in width at mean low water from the mouth to Bridgeport, thence a channel of the same depth and 60 feet wide to Springer's wharf, and thence a channel 5 feet deep at mean low water and 40 feet in width to the head of navigation at Swedesboro with a cut-off at Molonox Shoal. This project is practically completed. It appears that the additional improvements now desired are the extension of the 7-foot depth to Swedesboro and the protection of the mouth. The district officer states that the heaviest receipts and shipments are made at the wharves at Swedesboro, for which reason he believes that the full depth of 7 feet should be carried to that point. He further states that a broad shoal has formed at the mouth of Raccoon Creek, which will require annual redredging or the construction of a jetty. The estimated cost of extending the 7-foot channel to Swedesboro and dredging between the mouth of the creek and the 7-foot curve in Delaware River is \$25,300, and the estimated cost of jetty extending out to the main channel of the Delaware River is \$49,500, making the total cost of the proposed improvement \$74,800. The district officer is of opinion that the stream is worthy of further improvement to this extent. The division engineer concurs in general with the views of the district officer, but recommends that the jetty be built only as far as the eastern side of the inner channel of the Delaware River, which has sufficient depth and connects with the main channel both to north and south. The estimated cost of the work as thus modified is \$39,770.

3. These reports have been referred, as required by law, to the Board of Engineers for Rivers and Harbors, and attention is invited to its report herewith, dated January 13, 1914, recommending adoption of the modified plan favored by the division engineer.

4. After due consideration of the above-mentioned reports, I concur in general with the division engineer, and the Board of Engineers for Rivers and Harbors, and therefore report that the further improvement by the United States of Raccoon Creek, N. J., is deemed advisable under a modification of the existing project providing for a channel 7 feet deep at mean low water from the inner channel of Delaware River to Swedesboro, 75 feet wide to Bridgeport, thence 60 feet wide to Springer's wharf, and thence 40 feet wide to Swedesboro with a dike at the mouth, at an estimated cost of \$39,770 for first construction and about \$5,000 annually for maintenance. The full amount of the estimate should be provided in one appropriation. It should be noted that the present project has been practically completed for considerably less than its estimated cost, and that the estimate of the work now proposed is only about \$4,400 more than the unappropriated balance of the estimate for the existing project.

EDW. BURR,
*Colonel, Corps of Engineers,
Acting Chief of Engineers.*

REPORT OF THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS
ON SURVEY.

[Fifth indorsement.]

BOARD OF ENGINEERS FOR RIVERS AND HARBORS,
January 13, 1914.

To the CHIEF OF ENGINEERS, UNITED STATES ARMY:

1. This is a report of preliminary examination and survey of Raccoon Creek, N. J., including the construction of a dike or jetty at the mouth, if necessary.

2. Raccoon Creek is a tributary of the Delaware River, which it enters about 18 miles below Philadelphia. The existing project, adopted by the act of June 13, 1902, provides for a channel 7 feet deep at mean low water and 75 feet wide from the mouth for a distance of $1\frac{3}{4}$ miles to Bridgeport, thence a channel of the same depth and 60 feet wide to Springers Wharf, and thence a channel 5 feet deep at mean low water and 40 feet in width to the head of navigation at Swedesboro, $9\frac{3}{4}$ miles from its mouth, at an estimated cost of \$102,135. This project, including a cut-off at Molonox Shoal, has been practically completed at less than the estimated cost.

3. Thirty-four vessels are regularly employed on this stream, using 21 landings and wharves and handling a commerce amounting to about 92,000 tons. A large part of this traffic is carried on at the wharves at Swedesboro, necessitating an increase in depth to 7 feet up to that point. This is the improvement desired with such work at the mouth as may be necessary to insure stable conditions.

4. The district officer is of opinion that further improvement is desirable, and he recommends that the project be amended by extending the 7-foot depth to Swedesboro and by the construction of a jetty 2,250 feet long at the mouth with the necessary dredging to carry the 7-foot channel into water of that depth in the main channel of the Delaware River, all at an estimated cost of \$74,800. The estimate for maintenance is \$5,000 for the channel and \$500 for the jetty. The division engineer does not believe it necessary to carry the jetty across the present natural inside channel just off the mouth. He recommends the adoption of a modified project along the lines proposed by the district officer, but extending the jetty only to the inside channel. The estimated cost of this plan is \$39,770.

5. This small stream has a commerce of considerable extent and value, a large part of which is handled near the upper end of the reach now under improvement, necessitating the full depth to that point. The work proposed in the modified plan suggested by the division engineer appears to be sufficient to meet the present needs of navigation, and its cost is considered reasonable when compared with the benefits that may be expected therefrom.

6. The board therefore recommends, in concurrence with the views of the division engineer, a modification of the existing project, so as to provide for a channel 7 feet deep at mean low water from the mouth of the river to Swedesboro—75 feet wide to Bridgeport, 60 feet wide thence to Springers, and 40 feet wide thence to Swedesboro—with a short dike and the necessary dredging at the mouth, at an estimated cost of \$39,770, with about \$5,000 annually for maintenance. This estimate is about \$4,400 more than the unap-

propriated balance for the existing project. The full amount of the estimate, \$39,770, should be made available in one appropriation.

7. In compliance with law, the board reports that there are no questions of terminal facilities, water power, or other subjects so related to the project proposed that they may be coordinated therewith to lessen the cost and compensate the Government for expenditures made in the interests of navigation.

For the board:

FREDERIC V. ABBOT,
Colonel, Corps of Engineers,
Senior Member Present.

PRELIMINARY EXAMINATION OF RACCOON CREEK, N. J.

UNITED STATES ENGINEER OFFICE,
Wilmington, Del., May 14, 1913.

From: The District Engineer Officer.

To: The Chief of Engineers, United States Army
(Through the Division Engineer).

Subject: Preliminary examination of Raccoon Creek, N. J.

1. In compliance with department letter of March 18, 1913, the following report is submitted upon a preliminary examination of Raccoon Creek, N. J., for which provision is made in the river and harbor act of March 4, 1913, as follows: Raccoon Creek, N. J. including the construction of a dike or jetty at the mouth, if necessary.

2. Raccoon Creek is a crooked tidal stream with a low and flat watershed. It lies wholly within Gloucester County, N. J., flows in a general northwesterly direction to the Delaware River about opposite Marcus Hook. The meadows along its banks are generally lower than high-tide level and once formed a large tidal basin. At present these lands are drained by sluices, the creek being excluded by banks or levees.

3. An examination was made by Mr. G. W. T. Miller, assistant engineer, from whose report I quote the following history:

4. The river and harbor act of August 2, 1882, appropriated \$3,000 for the improvement of the stream. A portion of this appropriation was expended for a survey which was made in 1883, report thereon being printed in the Annual Report of the Chief of Engineers for 1883, page 646, but no work of improvement was undertaken.

The river and harbor act of March 3, 1899, provided for a preliminary examination of Raccoon Creek. Reports thereon and upon the subsequent survey are printed in the Annual Report of the Chief of Engineers for 1900, page 1590, and in House Document No. 231, Fifty-sixth Congress, first session. The physical features and condition of the stream are thoroughly described in these reports, to which attention is respectfully invited. The project for improvement proposed was to dredge a channel 7 feet deep from the Delaware River to Springers, a distance of 5 miles, the width to be 75 feet up to Bridgeport, a distance of $1\frac{3}{4}$ miles, and 60 feet wide the remainder a distance of $3\frac{1}{4}$ miles; thence to Swedesboro, the head of navigation, a farther distance of $4\frac{3}{4}$ miles, the depth to be 5 feet and the width 40 feet, at an estimated cost of \$102,135. This project was adopted in the river and harbor act of June 13, 1902.

The river and harbor act of March 2, 1907, authorized a modification of the project consisting of the making of a cut-off through several sharp bends and shoal reaches known as Molonox Shoal, about 2 miles below Swedesboro. This shortened the distance from Swedesboro to Springers by a little over half a mile. The distance from Swedesboro to the Delaware River is now about $9\frac{1}{4}$ miles.

This improvement has progressed as funds were available and has now about reached completion for much less than the estimated cost. Maintenance of the

annel has been carried on as the improvement progressed. The estimated quantity to be removed to effect the improvement was 371,400 cubic yards. Up to date 9,698 cubic yards have been removed.

5. The additional improvements now desired are the extension of the 7-foot depth to Swedesboro and the protection of the mouth.

6. I have personally examined this stream on several occasions, recently for the purpose of preparing this report.

7. The traffic of the stream is carried by gasoline boats and barges, and one steamboat plying daily between Bridgeport and Philadelphia, and by occasional steam tugs with barges. Mr. Miller reports 34 vessels regularly employed, with an aggregate tonnage of 4,823, and drafts between 4 and 6 feet. In 1912 the commerce amounted to 16,688 short tons, valued at \$1,163,700. About 21 landings and wharves are used. The incoming freight consists principally of fertilizers, coal, building and road materials, and domestic commodities. The outgoing freight is farm produce, fruit, and truck. Vegetables are shipped in large quantities by rail to Boston and other eastern cities, and by boat to Philadelphia, Chester, and other places on the Delaware River. For shipments of this kind, Raccoon Creek ranks at the head of the list of tributaries of Delaware River and Bay.

8. The heaviest receipts and shipments are made at the wharves at Swedesboro, for which reason the full depth of 7 feet should be carried to that point. This necessity has been pointed out in the annual reports of 1910, 1911, and 1912.

9. A greater width at bottom than 40 feet will be impracticable without endangering the stability of the banks, but this width will accommodate the existing traffic and permit a substantial increase. This improvement can be made without exceeding the original estimate of cost of the improvement of the stream, and, in my opinion, is necessary and proper.

10. The sketch¹ submitted herewith shows the old channel which formerly separated Raccoon Island from the mainland. This channel was once deep, and the ebb tide of the Delaware River flowing through it assisted in maintaining a good depth at the mouth of Raccoon Creek. In recent years this channel has shoaled and is now closed. A broad shoal has formed at the mouth of Raccoon Creek which will require annual redredging or the construction of a jetty. From my preliminary examination, I have formed the opinion that a jetty can be located so as to exclude from the channel of Raccoon Creek the bottom drift of the Delaware River shore, and concentrate both the flood and ebb currents of the creek so as to maintain the channel, without decreasing the tideway of either stream.

11. The proper location, length, and dimensions of such a jetty and the cost can be determined only by a survey of the mouth of Raccoon Creek and the adjacent shores of the Delaware River. No survey of the creek having been made since 1899, it is desirable to cover the stream from Swedesboro to the mouth, the data to be obtained between Springers and the mouth being only sufficient to bring the map up to date.

12. Raccoon Creek is worthy, in my opinion, of further improvement by carrying the 7-foot depth to Swedesboro and by protection of the mouth to an extent dependent upon the cost of the work.

¹ Not printed.

13. To determine the cost of a jetty as compared with the cost of annual redredging at the mouth, I recommend a survey.

14. No question of terminals, water power, or other correlated development is involved.

R. R. RAYMOND,
Major, Corps of Engineers

[First indorsement.]

OFFICE DIVISION ENGINEER, EASTERN DIVISION,
New York City, May 17, 1913

To the CHIEF OF ENGINEERS, UNITED STATES ARMY:

Concurring in the views of the district engineer officer that the stream is worthy of further improvement by carrying the 7-foot depth to Swedesboro, without expense beyond the estimate for the improvement now in progress. So far as the jetties at mouth are concerned, a survey should be made to determine the cost.

WM. T. ROSSELL,
Colonel, Corps of Engineers

[Third indorsement.]

BOARD OF ENGINEERS FOR RIVERS AND HARBORS,
May 27, 1913

To the CHIEF OF ENGINEERS, UNITED STATES ARMY:

For reasons stated herein, the board concurs with the district engineer officer and the division engineer in recommending a survey in order to determine the extent and advisability of the improvement.

For the board:

LANSING H. BEACH,
Colonel, Corps of Engineers,
Senior Member Present

SURVEY OF RACCOON CREEK, N. J.

UNITED STATES ENGINEER OFFICE,
Wilmington, Del., December 16, 1913

From: The District Engineer Officer.

To: The Chief of Engineers, United States Army
(Through Division Engineer).

Subject: Report of survey of Raccoon Creek, N. J.

1. The following report of survey of Raccoon Creek, N. J., authorized by Engineer Department letter, is submitted.

2. The field work was by Mr. William E. Snyder, junior engineer (surveyor), under the supervision of Mr. George W. T. Miller, assistant engineer.

3. A report upon the preliminary examination of this stream was submitted May 14, 1913, and contained a description of the physical characteristics of the stream, a history of past improvements, and commercial statistics. No additional information regarding the business on Raccoon Creek was obtained.

4. The survey covered only those parts of the stream where additional soundings were required to those already on hand from recent soundings made by inspectors during dredging operations. The map herewith shows the result of the survey.

. The necessity for further improvement of the stream arises from principal causes: First, the shoal at the mouth which prevents vessels from entering or leaving at low stages of the tide; second, the small size of the channel in the upper river.

. The present project provides for a depth of 7 feet at mean low water from the mouth to Springer's wharf, the width at bottom being 40 feet to Bridgeport and 60 feet thence to Springer's. From Springer's to Swedesboro the channel is only 5 feet deep and 40 feet wide. At Swedesboro are wharves which handle a large part of the heavy freight of the stream, and ample channel dimensions up to that point are as necessary as in the lower creek. The largest vessels plying the creek go all the way to Swedesboro. For this reason the survey obtained data for computing the cost of a proper channel to Swedesboro.

. A short distance below Swedesboro is a highway bridge, shown in detail on the map, which requires proper approaches in the stream and the clearing out of obstructing shoals in one draw opening.

. The stream is tortuous in its course, but can not be advantageously straightened by cutting off points or shortened by making cut-offs, because the meadows along the banks have been protected by dikes and have been reclaimed to a greater extent than on any other stream in the district. Instead of the worthless marsh land usually required for cut-offs, valuable farm lands would be destroyed and the cost would be out of proportion to the benefits expected.

. The project of 1902 is practically completed at considerably less than the originally estimated cost, although the total yardage moved, including maintenance, 440,698 cubic yards, exceeds the original estimate by 69,298 cubic yards.

10. It is recommended that the project be amended to provide for a channel 40 feet wide and 7 feet deep from Springers to Swedesboro, as well as for making proper approaches to the Swedesboro wharves. This modification can be made without adding to the original estimate for the present project.

11. At the mouth of the creek a channel 100 feet wide on the bottom and 7 feet deep should be dredged out to the 7-foot curve in Delaware River. As this channel must cross the mud flats in such a direction that the Delaware River currents will always tend to silt it, a jetty will be necessary. The map shows the location proposed for such a jetty. It is on the downstream side of the mouth, for the following reasons: The junction of the ebb discharge from the creek with that of the river will cause the resultant current to scour the jetty throughout its length and thus maintain a good channel along the jetty. Ice carried by these ebb currents will be forced away from the mouth of the creek. During flood tide the swift upstream current in the river now forces ice directly into the creek. The proposed jetty will prevent this. If the jetty were located on the upriver side of the creek mouth, the discharge from the creek would not follow the jetty and maintain a channel, and flood-tide would completely close the creek in winter.

12. The jetty should be straight. This makes a cheaper structure per linear foot and a shorter one as well. Different types of jetty have been considered. The one believed to be best and most economical is the ordinary pile, brush, and stone jetty. This type is readily constructed for about \$20 per linear foot, is readily maintained by adding stone as the filling settles into the soft bottom, and lasts about

12 years. In this time the filling should be fully settled, and as the the woodwork above the water decays, the piles can be then cut down to the sound portion always wet, capped with a grillage and a permanent concrete superstructure. Such construction at the outlet would cost about \$4 per foot more than the type recommended, but would not adapt itself to the settlement sure to occur in the first few years.

13.

Estimate.

Dredging 126,500 cubic yards between Springers and Swedesboro (deposit on banks), at 15 cents per cubic yard.....	\$18,
Dredging 20,000 cubic yards between mouth of creek and 7-foot curve in Delaware River (scow work), at 20 cents per cubic yard.....	4,
	22,
Engineering and contingencies, about 10 per cent.....	2,
	25,
2,250 feet pile, brush, and stone jetty, at \$20 per foot.....	\$45,000
Engineering and contingencies, about 10 per cent.....	4,500
	49,
Total.....	74,

14. The balance unappropriated of estimate for existing project \$35,026.33. The total required to be appropriated in addition therefore \$39,773.67.

15. The dredging of the upper river should be done in one operation, as it will be useful only when completed and the river should be obstructed by dredging plant as short a time as possible. The dredging at the mouth should be done in one operation, but should be protected by the jetty when dug. The jetty should be constructed under one contract in order to fully protect the dredged channel, and this will be most economical.

16. It is estimated that the dredged channel can be maintained for \$5,000 per annum. The maintenance of the jetty is estimated \$500 per annum until a permanent structure is built.

17. Raccoon Creek is a busy stream with a well-established commerce. In my opinion it is worthy of the additional improvements recommended.

18. No questions of terminals, water power, or freshets are involved in the present problem.

R. R. RAYMOND,
Major, Corps of Engineers

[First indorsement.]

OFFICE OF DIVISION ENGINEER,
EASTERN DIVISION,
New York City, December 18, 1913

To the DISTRICT ENGINEER OFFICER,
Wilmington, Del.:

1. Returned.

2. The reasons for prolonging the dredged cut and jetty across inner channel and outside bar are not understood. This inner channel has sufficient depth and connects with the main channel both north and south. To the south its width is ample. To the north a very small amount of dredging on the projecting points along west side would also provide ample widths.

An estimate is requested for the improvement desired with the and jetty stopped at the eastern side of the inner channel, but including such work in this channel to the north of Raccoon Creek might be desirable.

W. M. BLACK,
Colonel, Corps of Engineers.

[Second indorsement.]

DISTRICT ENGINEER OFFICE,
Wilmington, Del., December 20, 1913.

the DIVISION ENGINEER, EASTERN DIVISION:

returned. The inside channel at present is not used below the mouth of the creek, due to the presence of stone, making it dangerous. The entire inside channel, both above and below the creek, is now being obliterated by the stone dike building at the head of Chester Island, 3½ miles above, to deflect the whole discharge of the Delaware River to the main ship channel along the Pennsylvania shore.

Estimate called for by paragraph 3, first indorsement.

Excavating 126,500 cubic yards between Springers and Swedesboro (deposit on banks), at 15 cents per cubic yard.....	\$18,975
Excavating 10,000 cubic yards between mouth of creek and inner 7-foot curve Delaware River (scow work), at 20 cents per cubic yard.....	2,000
	<hr/>
	20,975
Engineering and contingencies, about 10 per cent.....	2,095
	<hr/>
	23,070
Cost of pile, brush, and stone jetty, at \$16 per foot	\$15,200
Engineering and contingencies, about 10 per cent.....	1,500
	<hr/>
	16,700
	<hr/>
Total.....	39,770
Balance unappropriated of estimate of existing project.....	35,026

R. R. RAYMOND,
Major, Corps of Engineers.

[Third indorsement.]

OFFICE OF DIVISION ENGINEER,
EASTERN DIVISION,
New York City, December 27, 1913.

the CHIEF OF ENGINEERS:

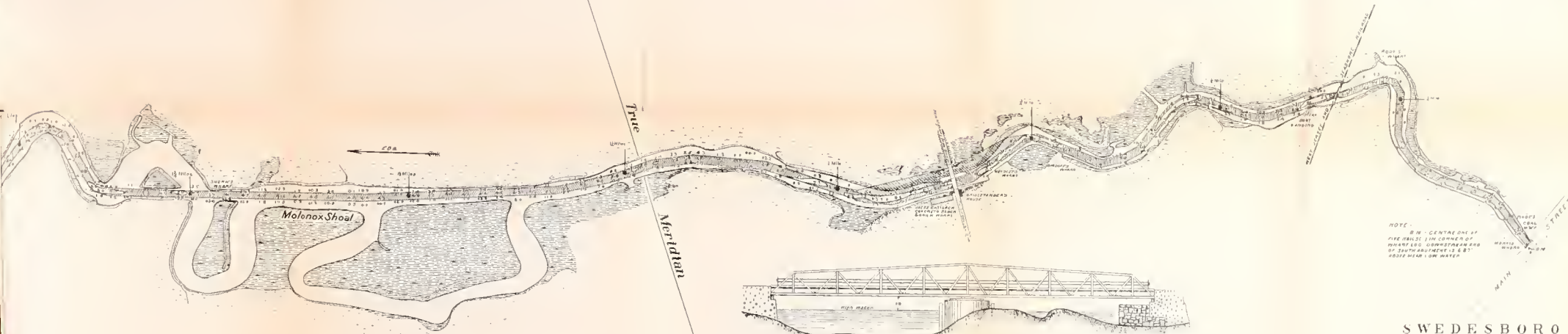
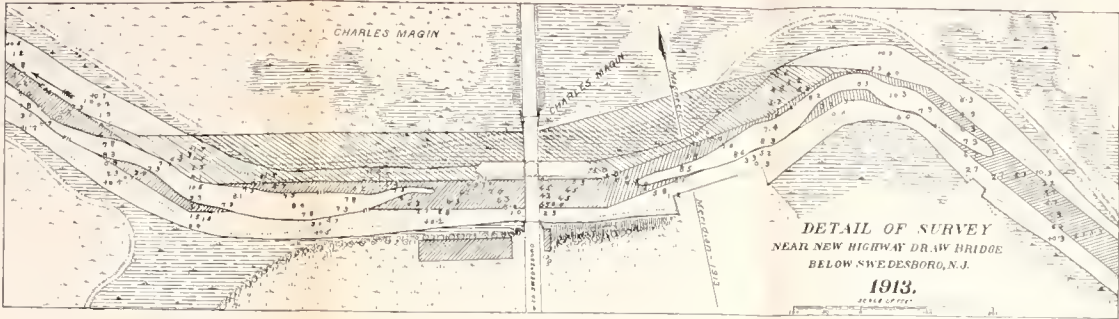
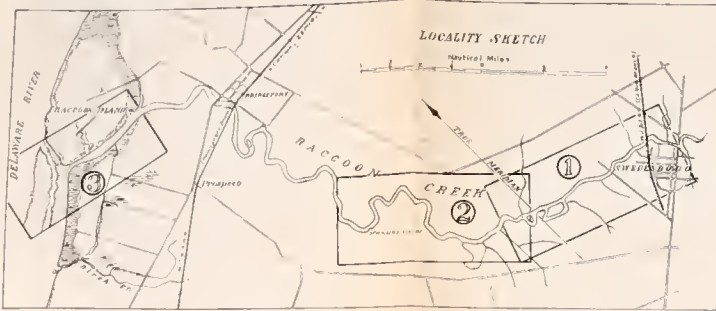
An examination of Coast and Geodetic Survey Chart No. 126 fails to disclose how a dike at the head of Chester Island can make any desired change in the eastern channel at the mouth of Raccoon Creek. I would recommend that the project submitted by the district engineer officer be modified so as to provide for the utilization of this channel under the estimate given in the second indorsement. Subject to the above the views and recommendations of the district engineer officer are concurred in.







W. M. BLACK,
Colonel, Corps of Engineers.

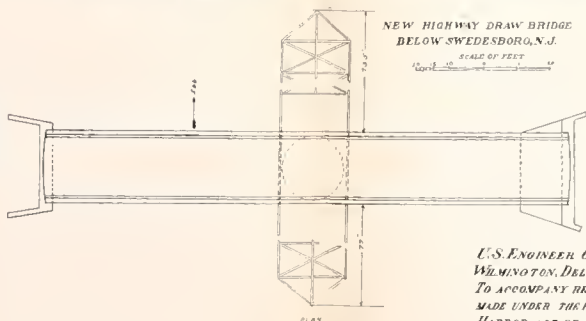
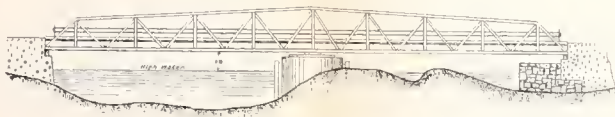
For report of the Board of Engineers for Rivers and Harbors on this subject, see page 3.]

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NOTE:-
Survey made by Wm. E. Snyder, Junior Engineer, under the supervision of George W. T. Miller, Assistant Engineer.
The survey of 1913 includes the mouth of the creek, inside the mouth thereof, and that portion of the creek near new highway draw bridge below Swedesboro. The soundings are reduced to mean low water and are expressed in feet and tenths.
The T curve is shown thus: 
The S curve is shown thus: 
The mean low water is shown thus: 
The proposed improvement is shown thus: 
The proposed Jetty is shown thus: 
Distances in miles are given from fixed highway bridge at Swedesboro, and are shown thus: 
Abbreviations: m-mud, s-sand, g-gravel, h-hard, s-soft.



U.S. ENGINEER OFFICE,
WILMINGTON, DELAWARE.
TO ACCOMPANY REPORT DATED DECEMBER 16, 1913,
MADE UNDER THE PROVISIONS OF THE RIVER AND
HARBOR ACT OF MARCH 3, 1913.
W. H. Raymond
MAJOR, CORPS OF ENGINEERS, U.S. ARMY

RACCOON CREEK,
NEW JERSEY.
FROM SWEDESBORO TO SPRINGER'S WHARF
COMPILED FROM SURVEYS OF 1899 AND 1913
AND
AT THE MOUTH
FROM SURVEY OF 1913.
SCALE OF FEET
10 20 30 40 50 60 70 80 90 100
IN THREE SHEETS
SHEET No. 1



RACCOON CREEK,
NEW JERSEY.

FROM SWEDESBORO TO SPRINGER'S WHARF
COMPILED FROM SURVEYS OF 1890 & 1913

AND
AT THE MOUTH
FROM SURVEY OF 1913.

SCALE OF FEET
0 10 20 30 40 50

IN THREE SHEETS
SHEET No. 2



